



Transportation Concept Report

State Route 17

District 5

November 2015



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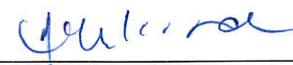
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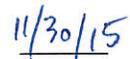
Provide a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability

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TABLE OF CONTENTS	PAGE
Chapter 1: Executive Summary	5
Chapter 2: Corridor Overview	8
Chapter 3: Corridor Performance	26
Chapter 4: Corridor Concept	36

TABLES	PAGE
Table 1.1: SR 17 Concept	5
Table 1.2: SR 17 Stakeholders	7
Table 2.1: Route Segmentation	8
Table 2.2: SR 17 Designations and Characteristics	9
Table 2.3: Freeway and Exits Information	10
Table 2.4: Freeway Agreements	11
Table 2.5: Facility Characteristics	14
Table 2.6: Multimodal Characteristics	18
Table 3.1.1: Segment 1 Daily System Operations	27
Table 3.1.2: Segment 1 Peak Hour Traffic Data	29
Table 3.2.1: Segment 2 Daily System Operations	32
Table 3.2.2: Segment 2 Peak Hour Traffic Data	35
Table 4.1: SR 17 Concept	36
Table 4.2: SR 17 Projects – Caltrans State Highway Operation and Protection Program (SHOPP)	38
Table 4.3: SR 17 Projects – SCCRTC Regional Transportation Plan (RTP)	39

FIGURES	PAGE
Figure 1.1: SR 17 Location	6
Figure 2.1: Route Segmentation	8
Figure 2.2: Santa Cruz County Average Commute Time	11
Figure 2.3: Santa Cruz County Means of Transportation	11
Figure 2.4: Generalized Land Use	13
Figure 2.5: Pavement Condition	15
Figure 2.6: Shoulder Width	15
Figure 2.7: Conflict Points Diagrams	17
Figure 2.8: SR 17 Access Management Plan Study Area	17
Figure 2.9: Median Openings and Access Points	18
Figure 2.10: Alternate Bicycle Facilities	19
Figure 2.11: Highway 17 Express Route Map	20
Figure 2.12: Trucks allowed to operate on SR 17 per STAA Truck Standards	22
Figure 2.13: Area Hydrology	23
Figure 2.14: Thorne Connectivity Areas, 2010	24
Figure 2.15: Mountain Lion Movements	25
Figure 3.1.1: Segment 1 Historical AADT by Year	27
Figure 3.1.2: Segment 1 Historical AADT by Location	28
Figure 3.1.3: Segment 1 Base Year and Horizon Year Congestion	30
Figure 3.2.1: Segment 2 Historical AADT by Year	32
Figure 3.2.2: Segment 2 Historical AADT by Location	33
Figure 3.2.3: Segment 2 Base Year and Horizon Year Congestion	34

Chapter 1: Executive Summary

Caltrans’ mission is to provide a safe, sustainable, integrated and efficient transportation system to enhance California’s economy and livability. Transportation Concept Reports (TCRs) play an active role in achieving this mission to serve the traveling public. The Transportation Concept Report (TCR) is primarily a technical document that: (1) identifies trends and deficiencies within a transportation corridor, and (2) provides a basis for considering future actions to preserve the integrity of the corridor over the long-term. This information is valuable to Caltrans and its local and regional partners as they consider needs and priorities for future investments.

Route Description

California Streets and Highways Code, Chapter 2, Article 3 states, “Route 17 is from Route 1 near Santa Cruz to Route 280 in San Jose.” SR 17 begins at the interchange with SR 1 in the city of Santa Cruz. The corridor extends northeast for 12.55 miles to the border with Santa Clara County. From the county line, the route continues for 13.94 miles in Santa Clara County, located in District 4. The northern terminus is the SR 17/I-280/I-880 interchange in the city of San Jose.

SR 17 in Santa Cruz County is a four-lane highway and consists of two segments. Segment 1, between SR 1 and Granite Creek Road, is classified as a freeway. Segment 2, from Granite Creek Road to the Santa Cruz-Santa Clara county line, is classified as a conventional highway. The surrounding terrain for both segments is mountainous.

Route Concept

The future concept of the corridor is to maintain the existing functional role and purpose to maximize mobility for local and interregional travelers. The concept includes maintaining a **four-lane freeway** between SR 1 and Granite Creek Road, labeled Segment 1.

The concept also includes **conventional highway with partial access control** from Granite Creek Road to the Santa Clara county line, labeled Segment 2.

Table 1.1: SR 17 Concept

Segment	Route Concept
Segment 1 SR 1 to Granite Creek Rd (SCR PM 0.000 – PM 5.453)	Four-lane freeway
Segment 2 Granite Creek Rd to SCR/SCL county line (SCR PM 5.453 – PM 12.553)	Four-lane conventional highway with partial access control



Figure 1.1: SR 17 Location

Strategies to Achieve Route Concept

Other improvements that are complementary to the concept include Intelligent Transportation Systems, Transportation Demand Management, and operational improvements.

Operational Improvements

- Caltrans will continue working with Santa Cruz County Regional Transportation Commission (SCCRTC) and Santa Cruz County to implement short-, medium-, and long-range access management recommendations identified in the forthcoming Highway 17 Access Management Plan.

Multimodal Improvements

- Caltrans will support SCCRTC and Santa Cruz Metro in efforts to improve the Highway 17 Express transit service as well as park-and-ride solutions adjacent to SR 17.

Maintenance and Preservation

- Caltrans' Goals include providing a safe transportation system for workers and users. Necessary safety improvements will continue to be addressed through the appropriate SHOPP category as needed.
- Proper preventative maintenance and rehabilitation of aging transportation infrastructure will prevent project deferrals, which lead to more expensive, full-scale replacements. Caltrans is committed to responsibly managing transportation assets.
- Caltrans recognizes the value of partnerships. Ongoing collaboration will be required to integrate planning for SR 17, the local road network, the local transit system, and local land use.

Segment 1 Corridor Performance Key Findings:

- Base Year (2013) conditions: congestion is low throughout the corridor in both directions.
- Horizon Year (2040) conditions: congestion is moderate in both directions.

Segment 2 Corridor Performance Key Findings:

- Base Year (2013) conditions: moderate congestion occurs in the AM peak (northbound) and PM peak (southbound).
- Horizon Year (2040) conditions: congestion is anticipated with volumes projected to exceed capacity in the AM peak (northbound) and PM peak (southbound).

Stakeholder Participation

Public entities associated with SR 17 are listed in Table 1.2. The objective of stakeholder outreach for the SR 17 TCR is to partner with stakeholders in identifying existing information and the preferred long-term concept for SR 17.

Table 1.2: SR 17 Stakeholders

Stakeholder	Role
Association of Monterey Bay Area Governments	Metropolitan Planning Organization
City of Santa Cruz	Local municipality
City of Scotts Valley	Local municipality
Santa Cruz County	County
Santa Cruz County Regional Transportation Commission	Regional Transportation Planning Agency
Santa Cruz Metropolitan Transit District	Transit Agency

Stakeholder Outreach Tasks

The stakeholder outreach tasks are intended to solicit discussion and feedback on the TCR.

Stakeholder Outreach Task 1: TCR Kickoff – Spring, 2015

The kickoff covers basic information about TCRs, including purpose, methodology, and schedule. It also provides stakeholders an opportunity to share initial input on the route to help guide the TCR development process. Stakeholders are welcome to share the information presented in the kickoff with interested parties, such as AMBAG and RTC subcommittees, through established communication channels.

Stakeholder Outreach Task 2: Preliminary Draft – Summer, 2015

This task involves sharing the first draft of the TCR. This step provides stakeholders an opportunity to review the existing conditions and a general overview of the corridor. The draft includes preliminary modeling forecasts depicting 2040 conditions and sharing Caltrans' draft concept of the corridor with stakeholders.

Stakeholder Outreach Task 3: Final Draft – Fall, 2015

This task includes completing revisions as necessary and holding a final presentation for applicable technical committees.

Chapter 2: Corridor Overview

Route Segmentation

SR 17 is divided into two segments based on a change in the functional classification. Segment 1 is classified as an urban freeway and Segment 2 is classified as a conventional highway in both urban and rural areas. Table 2.1 and Figure 2.1 depict route segmentation for the purposes of the TCR.

Table 2.1: Route Segmentation

Segment	From	To	Begin PM	End PM
1	SR 1	Granite Creek Rd	SCR_17_0.00	SCR_17_5.453
2	Granite Creek Rd	SCL County Line	SCR_17_5.453	SCR_17_12.553

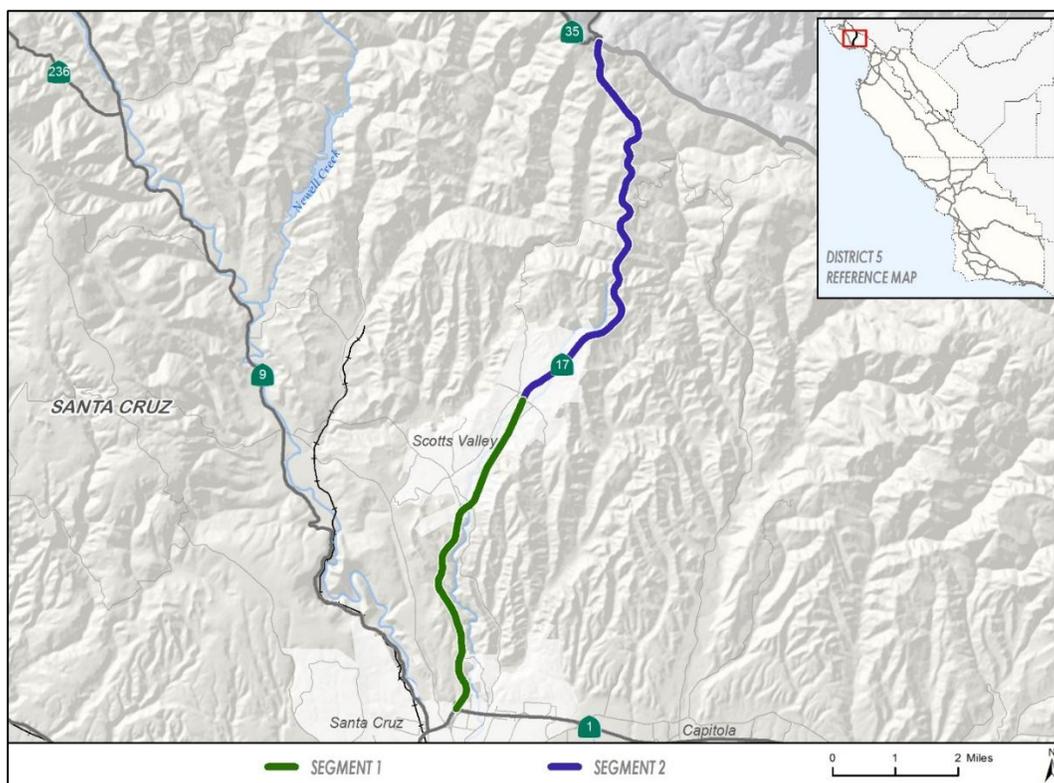


Figure 2.1: Route Segmentation

Route Purpose

SR 17 is an interregional route connecting the Central Coast with the Bay Area. In addition to providing interregional mobility to travelers, it also provides access for the surrounding communities and serves as a major north-south route in Santa Cruz County. It is a critical link in the movement of goods and services between Santa Cruz County and the Bay Area. The functional classification of the route is *Freeway or Expressway* on Segment 1 and *Principal Arterial* on Segment 2.

The largest component of weekday traffic is regional commuters traveling from Santa Cruz County and surrounding areas to large employment clusters in Santa Clara and other Bay Area counties. The route also serves weekend and seasonal traffic associated with the tourism industry in Santa Cruz County. The highway also carries local and regional traffic generated in the areas immediately surrounding the route, including the cities of Santa Cruz and Scotts Valley, and Census-designated places Pasatiempo and Laurel.

Major Route Features

The corridor is located in a varied geologic and topographic area. The route crosses the Santa Cruz Mountains, part of the Pacific Coast Mountain Range. The mountainous and densely wooded nature of the surrounding area is a factor in the horizontal and vertical alignment of the highway. The length of SR 17 covers an elevation change from about 50 feet above sea level at the SR 1 interchange to about 1,800 feet at the summit; from the summit the elevation descends to about 130 feet at the I-280 interchange. Geologic hazards that may affect the area include slides, mudflows, and active fault areas. Previous winter storms have caused surface runoff that has impacted SR 17.

Route Designations and Characteristics

Table 2.2 provides all applicable designations and characteristics by segment.

Table 2.2: SR 17 Designations and Characteristics

Segment	1	2
Freeway & Expressway System	Yes	No
National Highway System	No	No
Strategic Highway Network	No	No
Scenic Highway	Eligible	Eligible
Interregional Road System	Yes	Yes
Functional Classification	Freeway or Expressway	Principal Arterial
Goods Movement Route	No	No
Truck Designation	Terminal Access	Terminal Access
Rural/Urban/Urbanized	Urbanized	Rural/Urbanized
Metropolitan Planning Organization	AMBAG	AMBAG
Regional Transportation Planning Agency	SCCRTC	SCCRTC
Congestion Management Agency	N/A	N/A
Local Agency	City of Santa Cruz, City of Scotts Valley, Santa Cruz County	City of Scotts Valley, Santa Cruz County
Tribes	N/A	N/A
Air District	Monterey Bay Unified Air Pollution Control District	Monterey Bay Unified Air Pollution Control District
Terrain	Rolling	Mountainous

Community Characteristics

Santa Cruz County is located between the San Francisco Bay and the Monterey Bay. At 441 square miles, it is the second smallest county in California behind San Francisco¹. For US Census purposes, Santa Cruz County is included in the San Francisco Combined Statistical Area. The Census boundary for the Santa Cruz-Watsonville metropolitan area covers the entire county limits.

Santa Cruz County population grew 172 percent from 84,000 in 1960 to 230,000 in 1990². Much of the growth is attributed to the growth in jobs in the technology sector in Santa Clara County during this time. In 1978, Santa Cruz County adopted Measure J, which established an annual population growth goal (the adopted growth rate per year is 0.5 percent, as of 2012). Today the county population is 267,776³. US Census figures show that the county population grew by 1.7 percent between 2000 and 2010. The Santa Cruz County Transit Corridors Plan shows that the county population grew by about 3 percent between 2000 and 2012. The growth rate of the county is significantly lower than the 11 percent statewide rate.

The following demographic summaries are taken from the Transit Corridors Plan:

- Median age: 36.7
- Race: White (58.6%); Black (0.9%); Asian (4.2%); Other Race (2.9%)
- Ethnicity: Hispanic (32.9%)
- Median Household Income: \$65,253
- Median Housing Price: \$648,700

The countywide average commute time is 25.7 minutes, according to the Census. Figure 2.2 and Figure 2.3 detail commute pattern statistics⁴.

¹ Santa Cruz County General Plan, 1994.

² Santa Cruz County Transit Corridors Plan, 2012.

³ US Census, 2012.

⁴ Santa Cruz County Transit Corridors Plan, 2012.

Figure 2.2: Santa Cruz County Average Commute Time

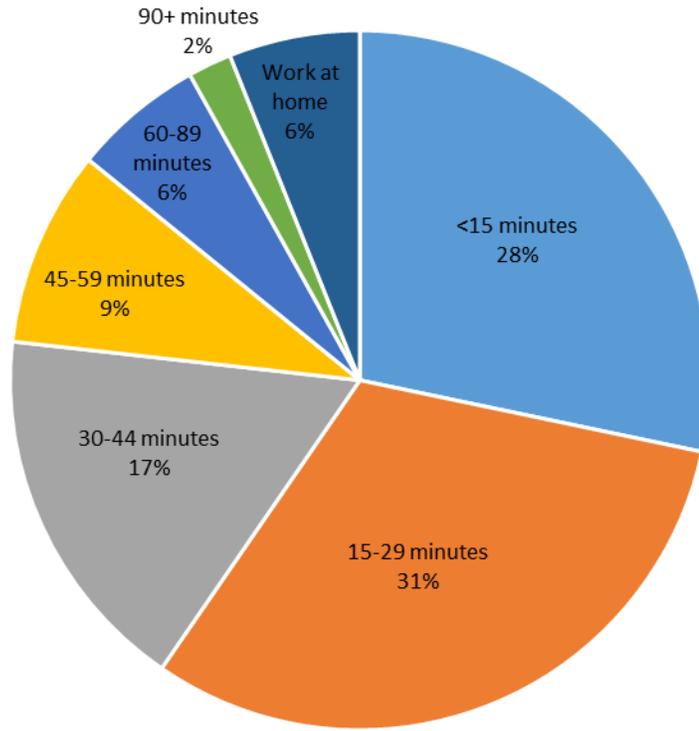
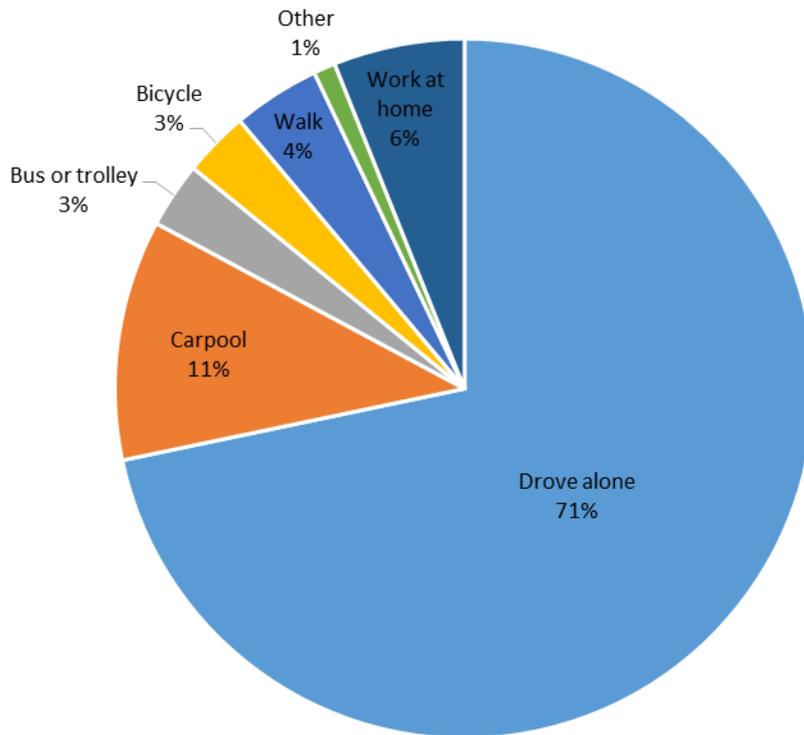


Figure 2.3: Santa Cruz County Means of Transportation



The Santa Cruz County Transit Corridors Plan discusses the dynamic between jobs and housing in the county. According to the plan, there are more employed residents than available jobs. The plan estimates that there are approximately 122,000 working residents in the county and approximately 110,000 jobs. As a result, between 25%-30% of residents commute out of the county daily for employment⁵. With 71 percent of commuters driving alone, this outbound commute to Santa Clara County and beyond drives the peak hour volumes on SR 17.

Within Santa Cruz County, downtown Santa Cruz is the largest job center. The services and tourism industries are key drivers of the economy in downtown Santa Cruz as well as northern portions of the county. Other employment concentrations include UC Santa Cruz, the Soquel Drive medical complex, Capitola Mall, and Cabrillo College.

Land Use

Segment 1 begins at the SR 1 interchange in the city of Santa Cruz. Prevalent land uses between SR 1 and Granite Creek Road are low and medium density residential. Segment 2 is predominantly surrounded by low density residential.

⁵ Estimate is based on the Transit Corridors Plan (approximately 25%) and RTC estimates (approximately 30%).

System Characteristics

SR 17 is a strategic interregional facility that connects Central Coast with the Bay Area, specifically connecting Santa Cruz and San Jose. Primary users of the corridor are passenger vehicles, trucks, and transit. Because of the mountainous terrain in this location, SR 17 features grade climbs and multiple curves. Despite these features, the route is the most viable connection between Santa Cruz and San Jose for passenger vehicles and trucks. SR 9 provides parallel connection, but is 16 miles longer when compared to SR 17. SR 9 is also designated as a lower functional classification (minor arterial and major collector). Free flow travel time between Santa Cruz and San Jose is 39 minutes on SR 17 and 1 hour 27 minutes on SR 9⁶.

Table 2.5: Facility Characteristics

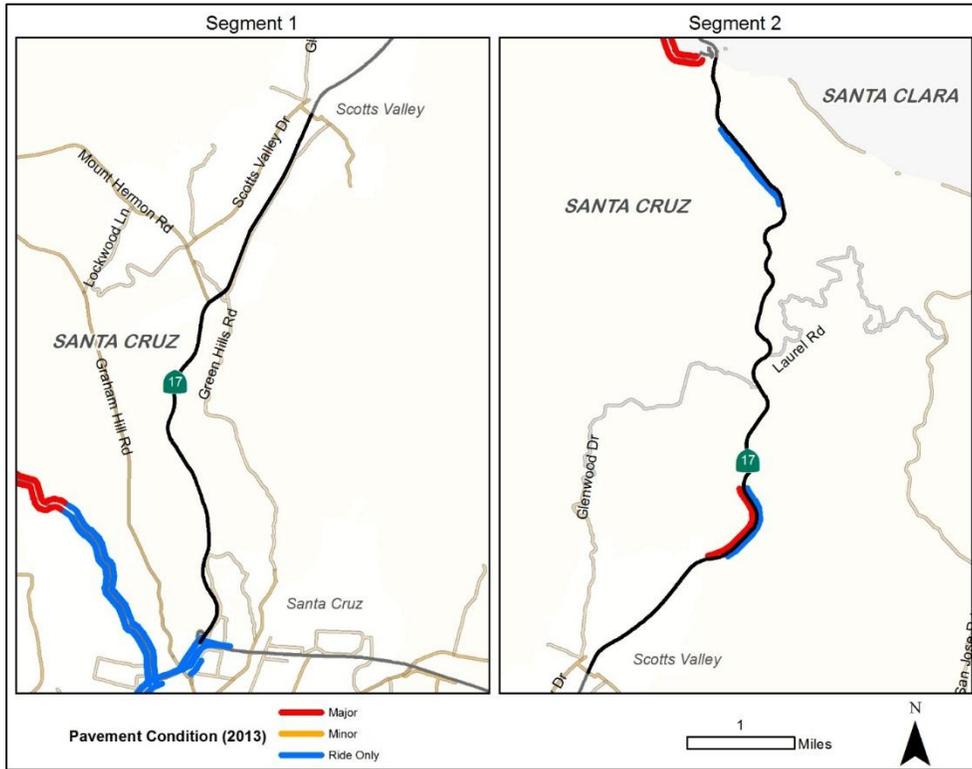
Segment	1	2
Facility Type	Expressway/Freeway	Conventional
Centerline Miles (Length)	5.453	7.1
Through Lanes	4	4
Lane Miles	21.812	28.4
Pavement Condition Right	No Distress	Ride
Pavement Condition Left	No Distress	Major/Ride
Shoulder Width Right (ft)	0 ft @ Madrona Dr; 0 ft @ Carbonera Creek; 8 ft+ all other locations	0 ft-8+ ft
Shoulder Width Left (ft)	0 ft @ Madrona Dr; 0 ft @ Carbonera Creek; 8 ft+ all other locations	0 ft-8+ ft

The Caltrans 2013 Pavement Condition Report depicts no distress on Segment 1. Segment 2 exhibited major distress on the southbound side near Scotts Valley, between Vine Hill Road (south) and Jarvis Road. Major pavement distress is pavement in poor condition with extensive cracks. Locations with Major distress require rehabilitation or resurfacing. Pavement with poor ride quality may require corrective maintenance, capital preventative maintenance, or both.

Other than the bridge structures over Madrona Drive and Carbonera Creek, Segment 1 has shoulders over eight feet in width. Shoulder widths vary on Segment 2, with narrow or no shoulders at some locations. Shoulder widening projects are in various project phases as of 2015. These projects are identified and discussed in Chapter 4.

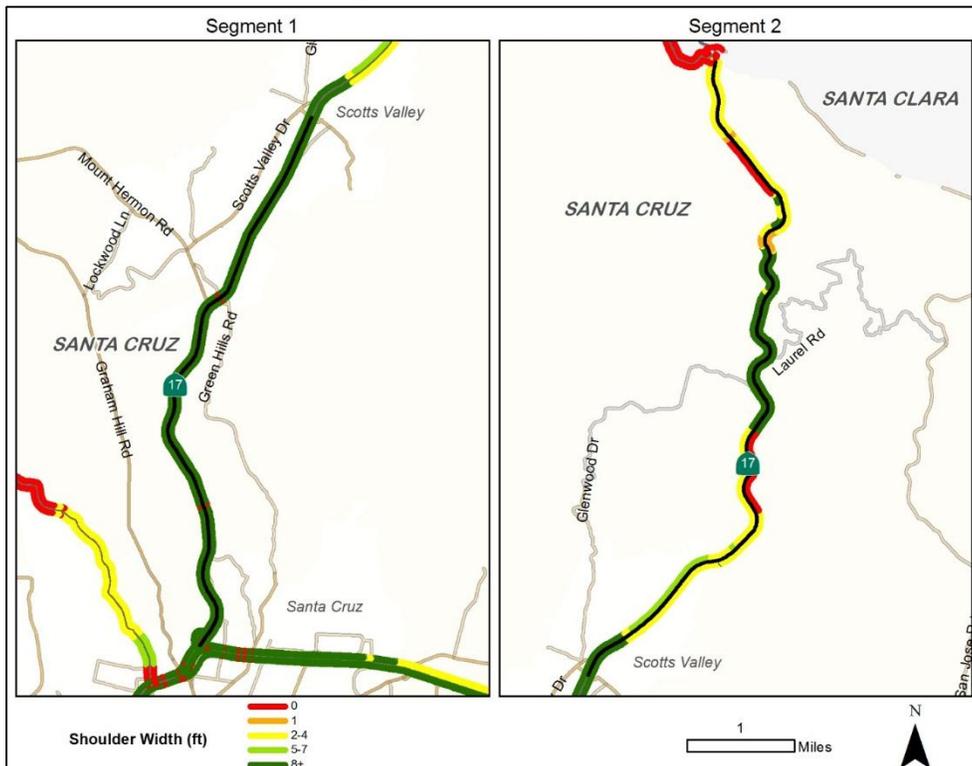
⁶ Google Maps, 2014.

Figure 2.5: Pavement Condition



Source: Caltrans Pavement Condition Survey, 2013.

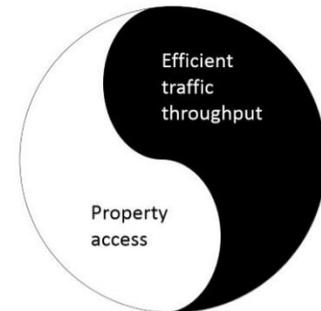
Figure 2.6: Shoulder Width



Access Management

SR 17 has a high interregional importance from a statewide perspective. Interregional routes create the backbone of the state transportation system and provide basic long-distance connection between regions for movement of people and goods. The entire system is managed and maintained by a variety of agencies.

SR 17 is unique compared to many other state routes. Considering the high daily and peak period volumes, SR 17 operates and functions similar to many urban expressways or freeways; however, it is located within an area that is predominantly rural. Unlike other expressways or freeways, SR 17 provides local access to many neighborhoods via local street intersections and driveways. Because of this contrast, several challenges stem from an imbalance between access and mobility. In addition to this imbalance, the mountainous terrain is a limiting factor for many standard transportation projects.



Source: FHWA

As a result of these issues, Caltrans is partnering with SCCRTC and Santa Cruz County on the Highway 17 Access Management Plan to address these challenges with innovative solutions. Since the study activities will extend to the summer of 2016, beyond the schedule of the TCR update, this update will provide a high-level summary of the study but not include recommendations.

The study builds from previous national and state literature that has shown that proper access management reduces congestion. Since it is difficult to maintain free flow conditions on a major road without limiting the number of access points, access management reduces congestion by improving average travel speeds. A statistical analysis from the Florida Department of Transportation has shown that well managed roads can operate more effectively than regular arterials. Improvements in mobility prolong the functional lifespan of a highway, preserving the public's investment in capital infrastructure. Effective access management strategies can decrease and delay the need for much more expensive capacity-adding projects, which is especially important for SR 17 because the physical and environmental constraints preclude widening.

The connection between access and mobility has to do with conflict points, or the number of locations where the travel paths of two vehicles may legally cross. The more opportunities to move on and off the roadway increases the potential for traffic flow disturbance. Managing access along a route can improve travel speeds and reliability. Consolidating the number of access points can reduce the number of conflict points, or the number of locations where the travel paths of two different vehicles may cross.

Figure 2.7 provides an example. A continuously open median, along with multiple closely-spaced driveways, creates a challenging situation for drivers. This is certainly the case on high-speed, high volume highways, where drivers need to constantly monitor numerous conflict points. Access management applications, such as raised medians, make driving more clear and predictable for users. In the example, the median opening restricts certain movements and eliminates conflict points.

Figure 2.7: Conflict Points Diagrams

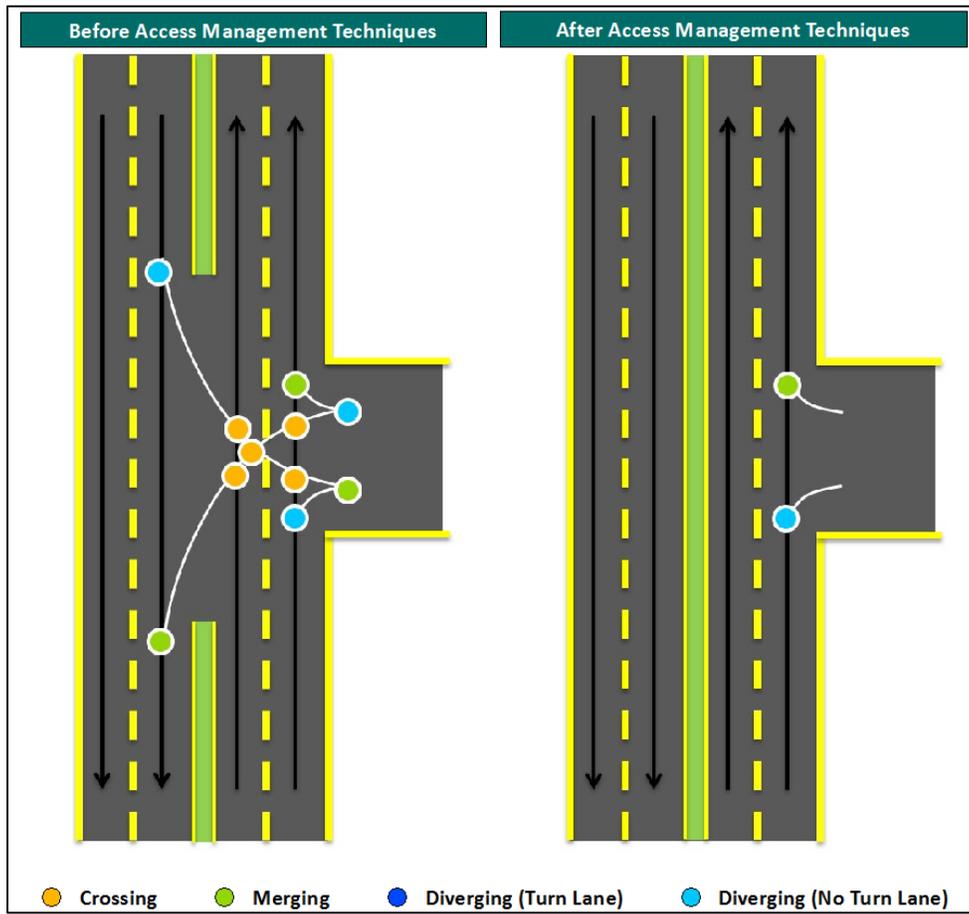


Figure 2.8: Access Management Plan Study Area

The SR 17 Access Management Plan represents a long-range planning-level study, which is the first step in a very long process. The preliminary objectives of the plan include reducing conflict points and preserving the function and operation of the SR 17 corridor as well as the local road network. The final goals and objectives of the study will be developed and identified in partnership with the local partners and the community during public engagement.

The study will focus on Segment 2, between Granite Creek Road in Scotts Valley and the Santa Clara county line. This portion is the length of SR 17 that is not designated on the Freeway and Expressway System. It will review existing conditions related to access and mobility, such as median characteristics, access points, and conflict points.

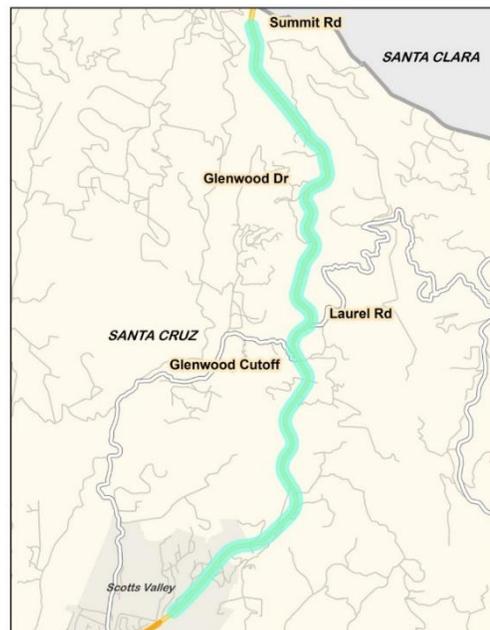
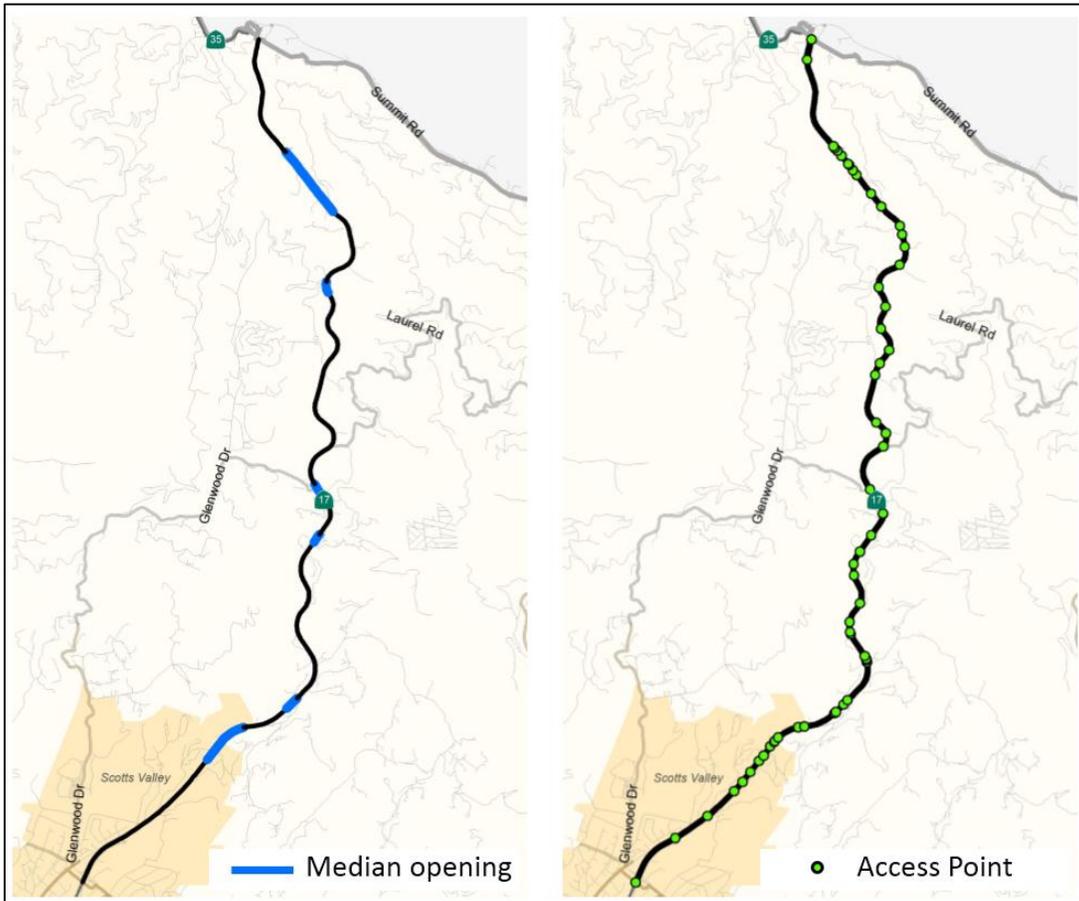


Figure 2.9: Median Openings and Access Points



Based on the existing conditions and input received from public engagement, the study will identify deficiencies or issues related to access. It will identify potential concepts to address these issues. The most viable concepts will be presented for partner and public review and comment. The result will be a list of project alternatives recommended for additional review through the Project Initiation Document phase.

Multimodal Facilities

Table 2.6: Multimodal Characteristics

Segment	1	2
Transit Facilities	Highway 17 Express; 35 – San Lorenzo Vly (SLV); 35A – SLV via Scotts Valley Dr	17 Express
AMTRAK Bus Stations	Cavallaro Transit Center; Scotts Valley	N/A
AMTRAK Thruway Bus	Yes	Yes

Bicycle and Pedestrian Facilities

Bicycles and pedestrians are prohibited on Segment 1, a freeway. While Segment 2 is defined as a conventional highway, it functions and operates similarly to an expressway or freeway. There are no bicycle or pedestrian facilities along SR 17, although they are not expressly prohibited on Segment 2.

The Santa Cruz County Bicycle Plan identifies several alternate routes that can be used by bicyclists to bypass SR 17. Alternate routes include Plymouth Street, El Rancho Drive, La Madrona Drive, Glen Canyon Road, Green Hills Road, South Navarra Drive, El Pueblo Road, and Scotts Valley Drive. In addition to alternate routes, future collaborative efforts are recommended to address enhancing local network and recreational connectivity for bicycles.

Transit Facilities

The Santa Cruz Metropolitan Transit District (METRO) operates the Highway 17 Express service in partnership with AMTRAK and the Santa Clara Valley Transportation Authority (VTA). The Highway 17 Express provides commuter bus service along SR 17 between the city of Santa Cruz and San Jose.

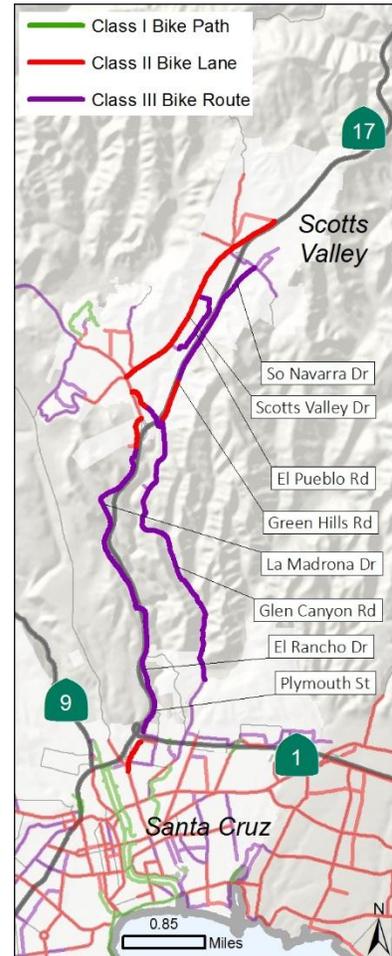


Figure 2.10: Alternate Bicycle Facilities

Figure 2.11: Highway 17 Express Route Map



In general, weekday commuter schedules are structured to serve people who live in Santa Cruz and work in Santa Clara County; there are nine northbound trips scheduled in the morning and eight southbound trips scheduled in the afternoon⁷. The Highway 17 Express averages approximately 1,200 riders on weekdays and 33,200 riders monthly (METRO ridership summary, April, 2013).

Most riders use the route to connect between the Metro Center and the Diridon Station⁸. Other connections include the Soquel Park and Ride, which connects to Santa Cruz METRO route 71 (local route to Watsonville) and route 91X (express route to Watsonville). The San Jose Diridon Station provides service connections with the Altamont Corridor Express, AMTRAK Capitol Corridor, AMTRAK San Joaquin, and Caltrain. There is also a connection with the VTA light rail system at the stop at Santa Clara Street and 2nd Street in San Jose.

Recurring congestion impacts performance on the route. METRO’s 2013 Short Range Transportation Plan showed that the Highway 17 Express weekday on-time performance was the lowest of all system routes at 42.1 percent on-time arrival.

Local bus routes 35 and 35A also use Segment 1 of SR 17 on part of the route. These routes provide connectivity between city of Santa Cruz, Scotts Valley, and communities in the San Lorenzo Valley.

There are five park and ride lots associated with SR 17. The lots at Soquel Drive, Pasatiempo Drive, and the Cavallaro Transit Center are observed by the Highway 17 Express. All lots may also be used for carpool and vanpool. Park and ride facilities represent a typical transportation demand management strategy by encouraging transit and ridesharing. Caltrans’ concept for the SR 17 corridor is to support new or improved park and ride facilities to optimize efficiency and existing capacity.

⁷ As of December 2013, nine northbound runs are scheduled to arrive in San Jose on weekdays between 7 am and 9 am. Eight southbound runs are scheduled to depart San Jose on weekdays between 4 pm and 6 pm. A fewer number of runs are geared toward San Jose residents working in Santa Cruz. There are two southbound runs scheduled to arrive in Santa Cruz on weekdays between 7 am and 9 am and five northbound runs scheduled to depart Santa Cruz on weekdays between 4 pm and 6 pm.

⁸ Santa Cruz METRO Short Range Transportation Plan, 2013.

SCCRTC provides a traveler resources service called Commute Solutions. Commute Solutions is available to the traveling public for information on existing park and ride lots. Through Commute Solutions, SCCRTC is in the process of identifying new locations and needed improvements to the park and ride lot system. Other services include assistance with carpool matching, vanpool matching, vanpool startup, transit planning, and more. More information is available at commutesolutions.org.



Private Commuter Buses

Technology companies based in the Santa Clara County, such as Apple, Netflix, Yahoo, and Google, provide private commuter buses serving Santa Cruz County residents. The recent development of these private shuttles has resulted in benefits as well as concerns. From a traffic management and environmental perspective, the shared transportation opportunities helps remove single-occupant passenger vehicles that would have otherwise used the road system, including SR 17. Local concerns include impacts to the public transit system such as increasing demand at public park-and-ride facilities and loss of potential revenue for public routes such as the Highway 17 Express.

Freight

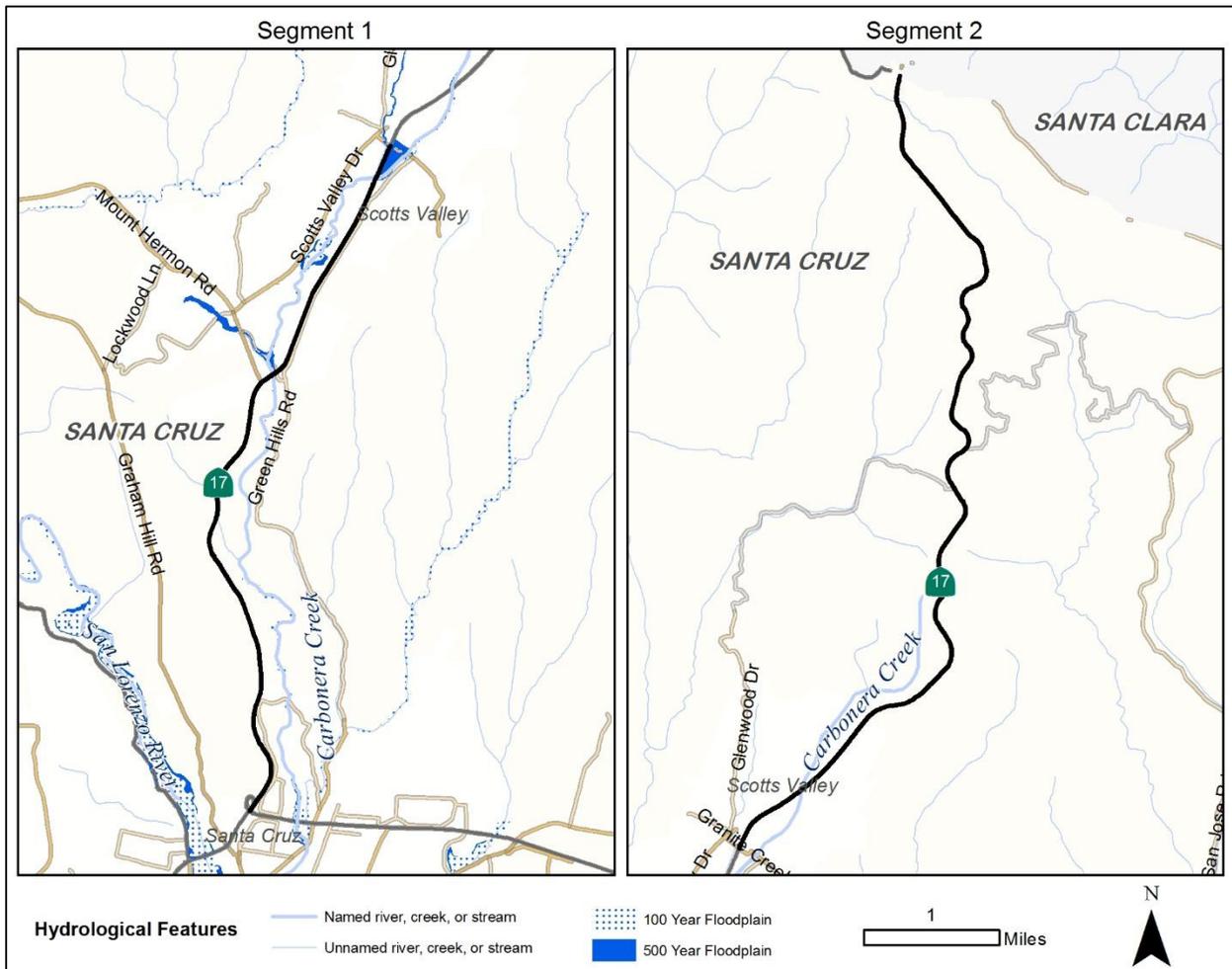
A study from 1994 listed SR 17 as the busiest freight route for truck traffic to and from the city of Santa Cruz⁹. As of the 2012 Caltrans traffic data, the route carries approximately 2,000 daily trucks, or approximately 3 percent of total AADT. At the county and regional levels, SR 17 carries less truck volumes to and from Santa Cruz County compared to SR 1 and SR 129, which are both identified as key District 5 freight highway facilities¹⁰.

SR 17 is designated as a Terminal Access Route on the California Truck Network. This designation entails that standard Surface Transport Assistance Act (STAA) trucks may operate on the route. The STAA standards designate the minimum truck sizes that all states must allow on the designated National Network.

⁹ Santa Cruz-Los Gatos Rail Corridor Study, 1994.

¹⁰ Although not an official designation, key District 5 freight highway facilities provide an understanding of the relative importance of SHS routes to freight. The facilities were identified in the AMBAG 2012 California Central Coast Commercial Flows Study.

Figure 2.13: Area Hydrology



Wildlife Connectivity

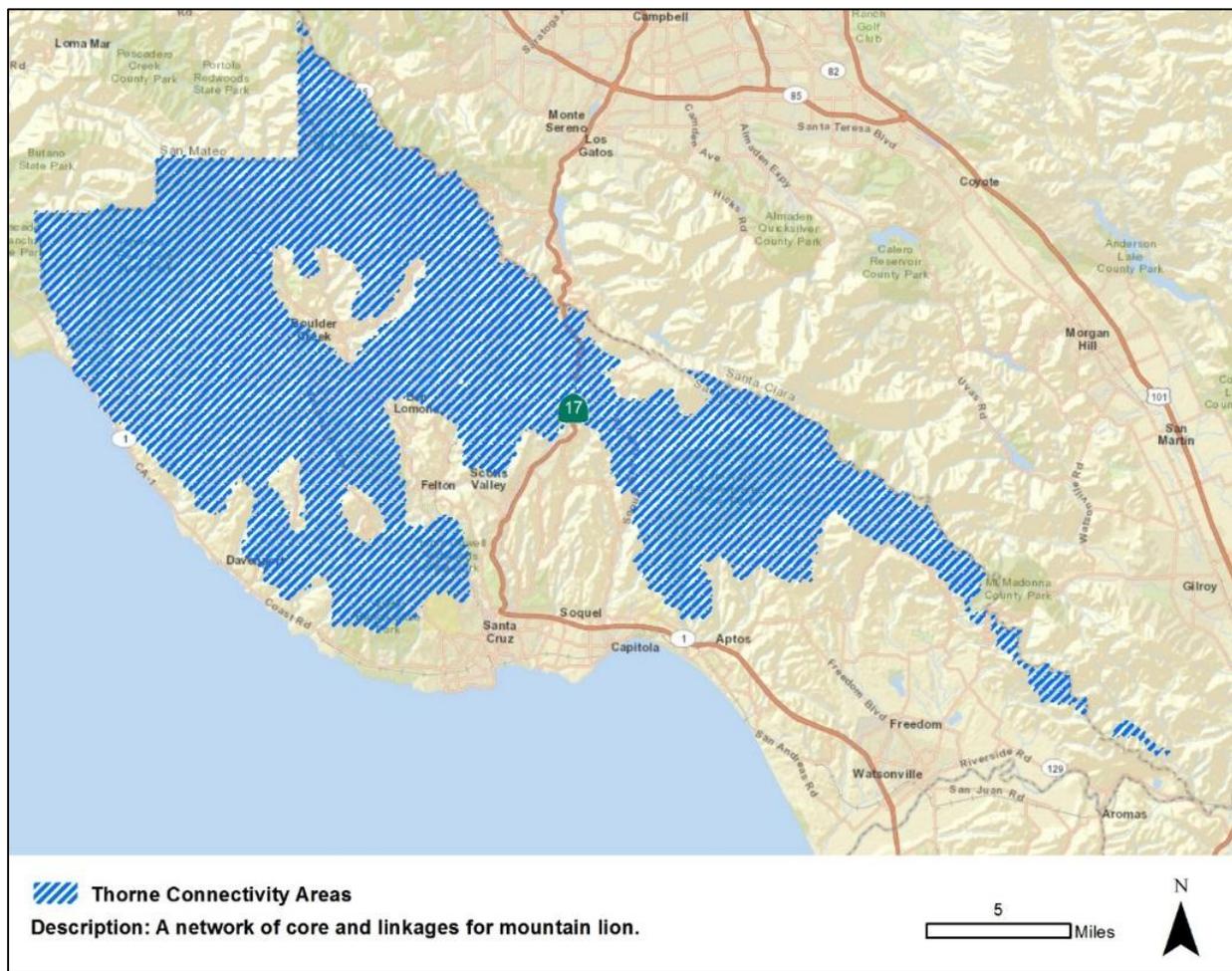
SR 17 is located within an important wildlife corridor and the California Essential Habitat Connectivity Project model depicts this area as having a high value for wildlife connectivity. In addition, several regional conservation plans have identified the SR 17 Corridor as a critical linkage in connecting the Santa Cruz Mountains with the Diablo Mountain Range to the east and the Gabilan Range to the south. Available resource datasets also confirm that the Santa Cruz Mountains provide important habitat for many species, and the California Natural Diversity Database documents observations of rare plant and animal species surrounding the highway corridor.

In 2014, Caltrans completed an analysis of wildlife connectivity needs in the District. The analysis was driven from a robust database of all available data. The data indicate the SR 17 wildlife corridor area to be important for many species including California red-legged frog, Marbled murrelet, steelhead, mountain lion, Zayante band-winged grasshopper, San Francisco popcorn flower, and redwood forest. According to UC Santa Cruz research biologists and Pathways for Wildlife conservation biologists, SR 17

presents a barrier to mountain lion movement and dispersal through the Santa Cruz Mountains (Figure 2.14).

In 2015, Caltrans completed a Project Initiation Document considering wildlife connectivity in the corridor. Specifically, Caltrans is interested in forming partnerships with local agencies and stakeholders to develop a strategy at Laurel Road. Caltrans District 5 Project Development staff recently completed preliminary engineering design options for a wildlife undercrossing at the Laurel Road location. The design options align with efforts made by the Land Trust of Santa Cruz County to purchase 290 acres of land on both sides of SR 17 at Laurel Road. In Santa Clara County, Midpeninsula Open Space is moving forward with developing preliminary engineering designs for retrofitting Lexington and Trout Creek culverts to improve wildlife connectivity between protected lands.

Figure 2.14: Thorne Connectivity Areas, 2010



Source: UC Davis Wildlife Connectivity Study (note that the blue hashing symbolizing the Thorne Connectivity Areas represents mountain lion migration in Santa Cruz County only.)

Chapter 3: Corridor Performance

The performance of the SR 17 is organized by the following categories:

- System Characteristics – identification of the general characteristics of the route.
- System Operation – evaluation of the route through the AMBAG Regional Travel Demand Model and Caltrans historical data. The base year Annual Average Daily Traffic (AADT) is based on Caltrans historical data. Horizon year AADT projections were based on the AMBAG model.
- Peak Hour - analysis of congestion during the PM peak period.

Note that the AMBAG regional travel demand model developed for the MTP-SCS sets 2035 as the horizon year. For this analysis, District 5 Advanced Planning extrapolated using the AMBAG model to develop forecasts for horizon year 2040; this was completed according to standard modeling practices. The 2040 horizon year is used for the SR 17 TCR to align with the 2040 California Transportation Plan.

Additional information about the technical methodology and performance measure can be found in Appendix A.

Segment 1

SR 1 to Granite Creek Road

PM 0.00 – PM 5.453

System Characteristics

Segment 1 provides connection between the city of Santa Cruz and Scotts Valley. There is an elevation change of approximately 500 feet within the Segment 1 limits. Trucks make up 2.7 percent of total traffic.

System Operations

2013 AADT volumes range from 54,000 to 63,000 vehicles per day (Table 3.1.1). Historical AADT data shows little variation in volumes between 1992 and 2013 (Figure 3.1.1). The AMBAG regional model (count corrected) predicts that volumes will increase to a range of 68,200 AADT to 78,100 AADT by 2040. The highest AADT in 2013 is near the SR 1 interchange, with an AADT of 63,000 (Figure 3.1.2).

PM Peak Hour Data

The data indicates low congestion in the base year. Congestion at some locations is projected to become moderate by 2040 (Figure 3.1.3).

Table 3.1.1: Segment 1 Daily System Operations

AADT Base Year 2013	54,000 to 63,000
AADT Horizon Year 2040	68,200 to 77,100
AADT Growth Rate (Vehicles/Year)	520 to 710
VMT Base Year 2013	320,000
VMT Horizon Year 2040	389,700

Source: Caltrans historical data (2013) and AMBAG model v1.4 (2040)

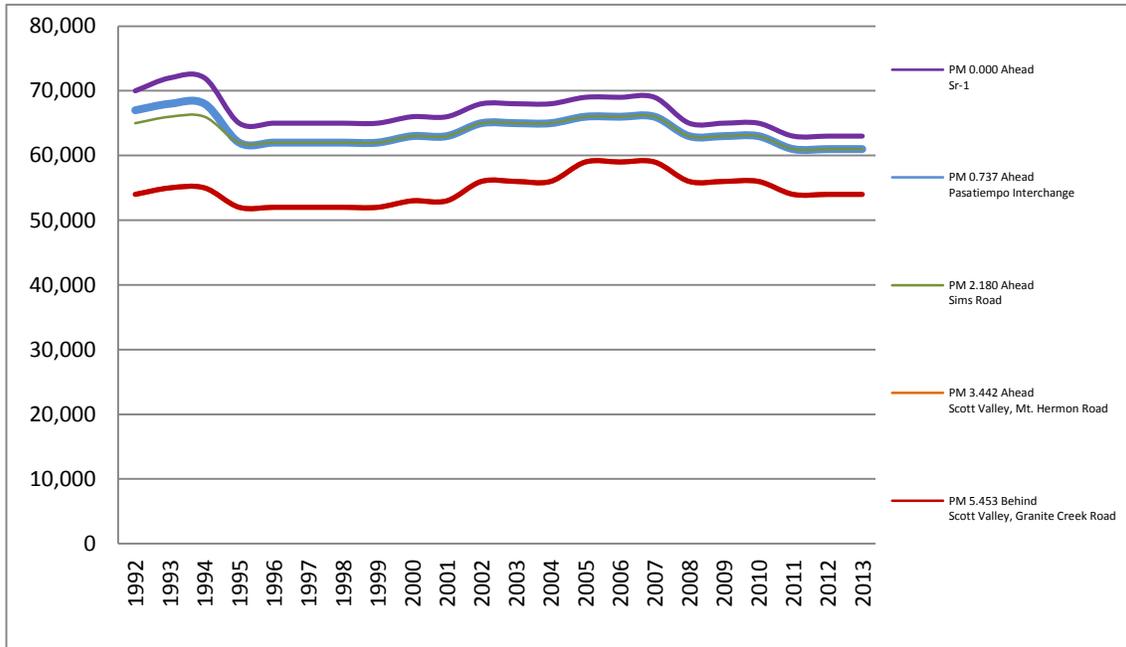


Figure 3.1.1: Segment 1 Historical AADT by Year

Figure 3.1.2: Segment 1 Historical AADT by Location

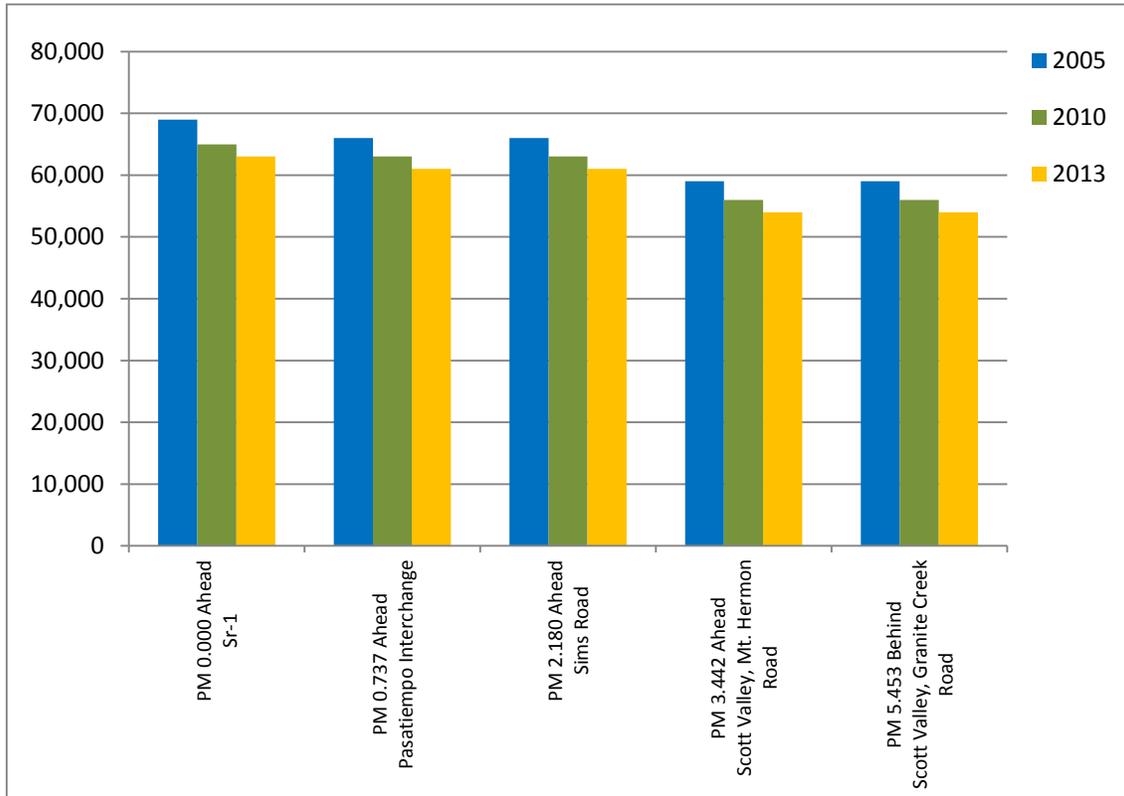
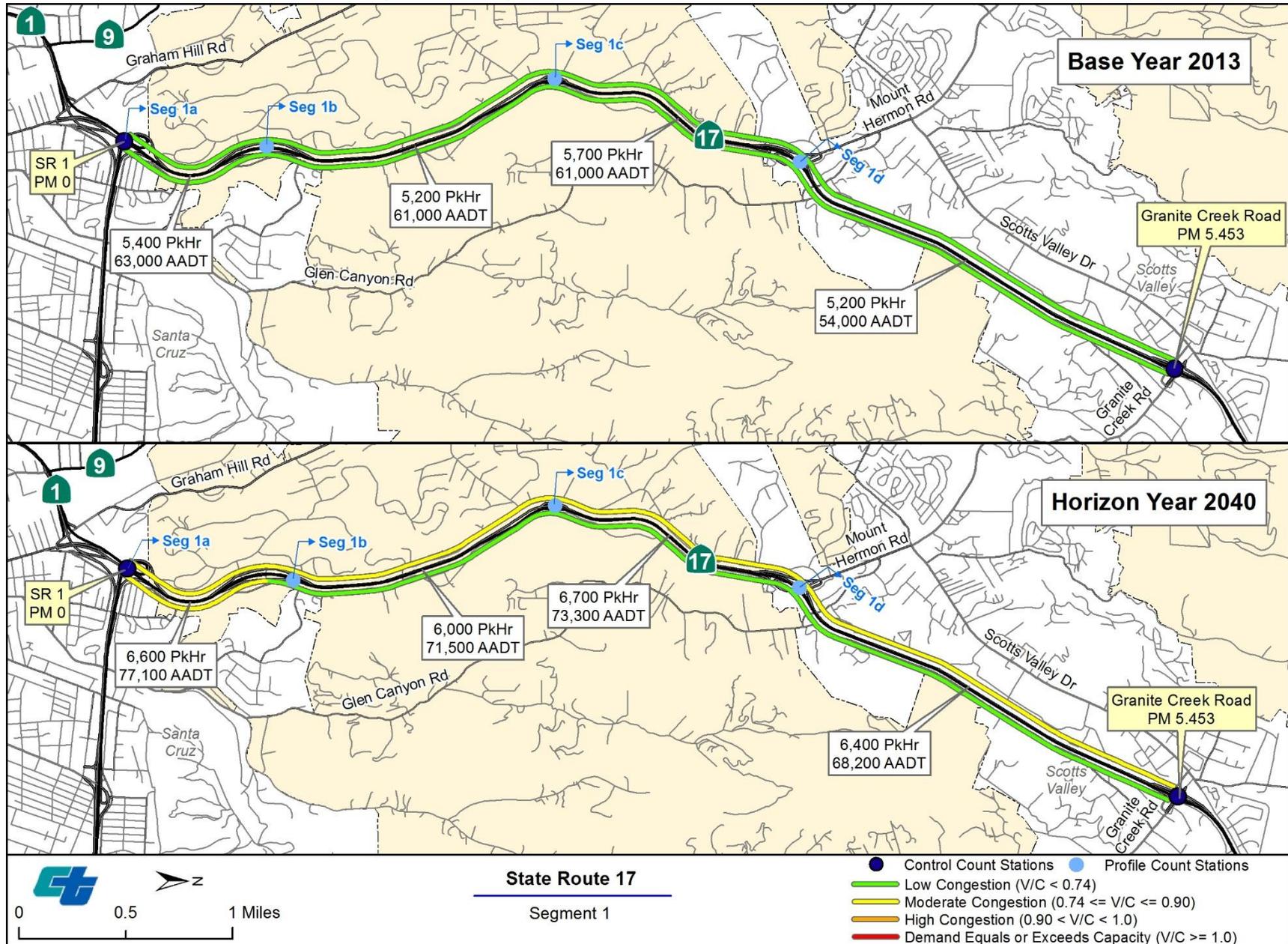


Table 3.1.2: Segment 1 Peak Hour Traffic Data

	Northbound	Southbound
Segment Length (Miles)	5.453	
PM Peak Hour Directional Split Base Year 2013	41.1% to 53.3%	46.7% to 58.9%
PM Peak Hour Directional Split Horizon Year 2040	41.9% to 51.4%	48.6% to 58.1%
PM Peak Hour Volume Base Year 2013	5,200 to 5,700	
	2,100 to 2,900	2,500
PM Peak Hour Volume Horizon Year 2040	6,000 to 6,700	
	2,700 to 3,400	3,100 to 3,700
PM Peak Hour Growth Rate (vehicles/year)	42 to 62	
PM Peak Hour VMT Base Year 2013	13,300	15,800
PM Peak Hour VMT Horizon Year 2040	15,900	19,000
PM Peak Hour VHT Base Year 2013 (Model based)	244	301
PM Peak Hour VHT Horizon Year 2040 (Model based)	329	445
PM Peak Hour V/C Base Year 2013	0.486 to 0.686	0.605 to 0.724
PM Peak Hour V/C Horizon Year 2040	0.653 to 0.803	0.760 to 0.897
PM Peak Hour LOS Base Year 2013	B to C	C
PM Peak Hour LOS Horizon Year 2040	C to D	C to D
PM Speed (mph) Base Year 2013 (Model based)	47.4 to	44.3 to
	64.8 mph	63.2 mph
PM Speed (mph) Horizon Year 2040 (Model based)	37.5 to	32.2 to
	64.0 mph	57.5 mph

Figure 3.1.3: Segment 1 Base Year and Horizon Year Congestion



Segment 1 Corridor Performance Key Findings

- Base year (2013) conditions: congestion is low throughout the corridor in both directions.
- Horizon year (2040) conditions: congestion is moderate in the southbound direction. Congestion is moderate in the northbound direction near the SR 1 interchange (Figure 3.1.3). Conditions are reversed in the AM peak.

Segment 2

Granite Creek Road to Santa Clara County Line

PM 5.452 – PM 12.553

System Characteristics

Segment 2 traverses mountainous terrain, gaining a maximum elevation of 1,800 feet. Segment 2 primarily serves commuter traffic, and also provides access to local communities surrounding the route. Trucks make up 2.7 percent of total traffic. Congestion levels are low in the base year and moderate in the southbound direction in the horizon year.

System Operations

2013 AADT is 54,500 (Table 3.2.1). Similar to Segment 1, historical AADT data shows little variation in volumes between 1992 and 2013. According to the AMBAG forecast, 2040 AADT is expected to increase to 75,000.

PM Peak Hour Data

Base year data indicates low congestion in the northbound direction and moderate in the southbound direction. By 2040, increased commuter demand is projected to exceed capacity in the southbound direction. Northbound congestion is projected to remain low in 2040 during the PM Peak. Conditions are reversed in the AM peak.

Bottlenecks

Horizon year congestions is projected to increase substantially, with volumes exceeding capacity ($v/c = 1.142$) Capacity along Segment 2 is restricted due to narrow shoulder widths, turns, steep grades, and concentrations of access points. Addressing congestion through additional lane capacity is considered infeasible.

Table 3.2.1: Segment 2 Daily System Operations

AADT Base Year 2013	54,500
AADT Horizon Year 2040	75,000
AADT: Growth Rate (Vehicles/Year)	1,030
VMT Base Year 2013	387,000
VMT Horizon Year 2040	532,600

Source: Caltrans historical data (2013) and AMBAG model v1.4 (2040)

Figure 3.2.1: Segment 2 Historical AADT by Year

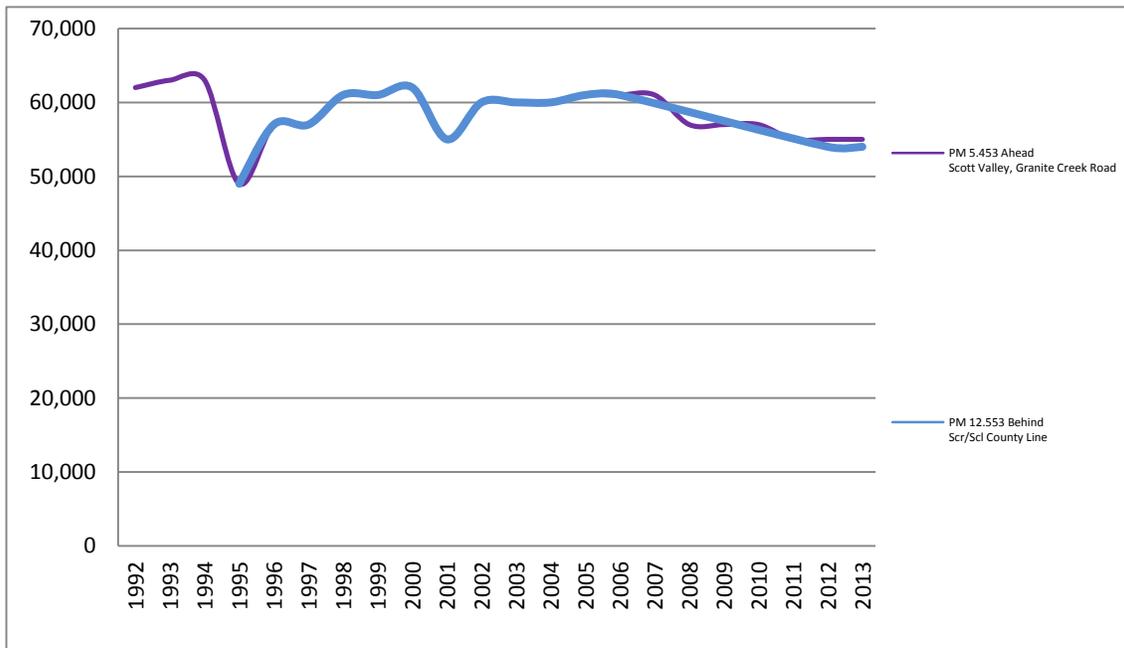


Figure 3.2.2: Segment 2 Historical AADT by Location

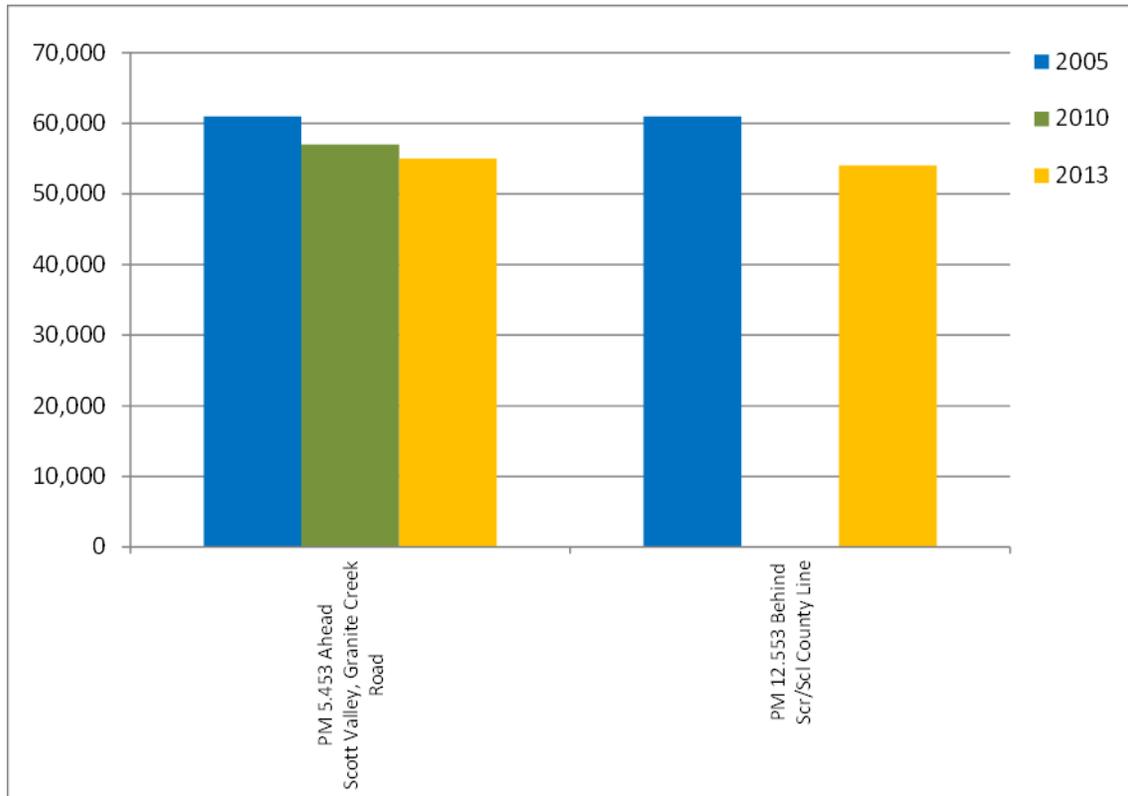


Figure 3.2.3: Segment 2 Base Year and Horizon Year Congestion

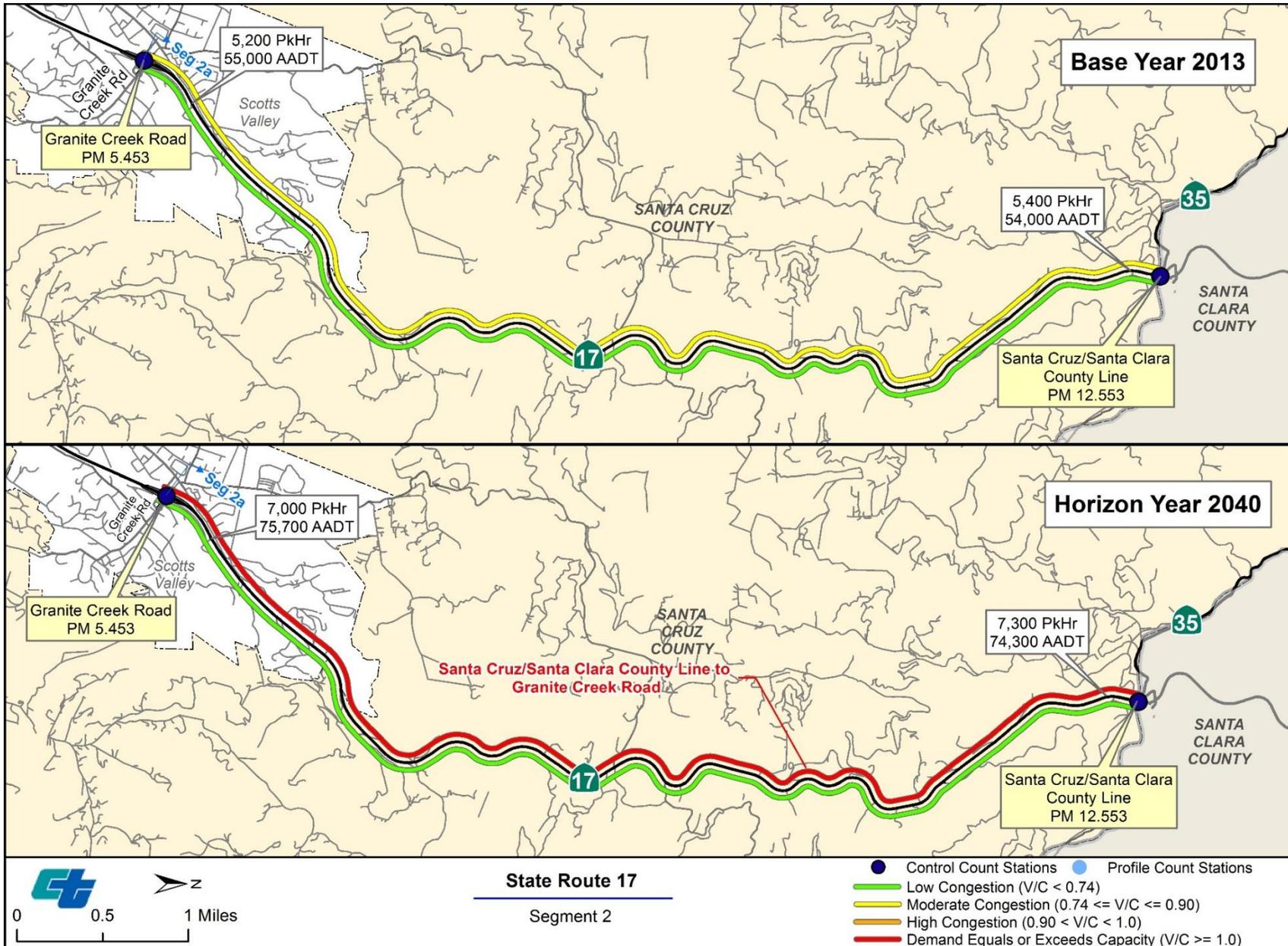


Table 3.2.2: Segment 2 Peak Hour Traffic Data

	Northbound	Southbound
Segment Length (Miles)	7.1	
PM Peak Hour Directional Split Base Year 2013	35.9%	64.1%
PM Peak Hour Directional Split Horizon Year 2040	37.1%	62.9%
PM Peak Hour Volume Base Year 2013	4,500	
	1,600	2,900
PM Peak Hour Volume Horizon Year 2040	6,100	
	2,300	3,800
PM Peak Hour Growth Rate (vehicles/year)	79	
PM Peak Hour VMT Base Year 2013	11,500	20,500
PM Peak Hour VMT Horizon Year 2040	16,000	27,200
PM Peak Hour VHT Base Year 2013 (Model based)	240	534
PM Peak Hour VHT Horizon Year 2040 (Model based)	355	980+
PM Peak Hour V/C Base Year 2013	0.429	0.794
PM Peak Hour V/C Horizon Year 2040	0.662	1.142
PM Peak Hour LOS Base Year 2013	B	D
PM Peak Hour LOS Horizon Year 2040	C	F
PM Speed (mph) Base Year 2013 (Model based)	47.9 mph	38.4 mph
PM Speed (mph) Horizon Year 2040 (Model based)	47.9 mph	27.8 mph

Segment 2 Corridor Performance Key Findings

- Base year (2013) conditions: PM Peak congestion is low in the northbound direction and moderate in the southbound direction. Conditions are reversed in the AM peak.
- Horizon year (2040) conditions: congestion is expected to worsen in the southbound direction as volumes increase, eventually projected to exceed capacity. Conditions are reversed in the AM peak.

Chapter 4: Corridor Concept

Concept Rationale

The concept is based on the findings of the corridor overview and corridor performance. The concept also takes into consideration key corridor issues, which are identified in the corridor overview. Along with the general concept, Caltrans recommends ongoing strategies to manage the corridor and sustain existing transportation investments.

Segment 1 Corridor Performance Key Findings

- Base year (2013) conditions: congestion is low throughout the corridor in both directions.
- Horizon year (2040) conditions: congestion is moderate in the southbound direction. Congestion is moderate in the northbound direction near the SR 1 interchange. Conditions are reversed in the AM peak.

Segment 2 Corridor Performance Key Findings

- Base year (2013) conditions: PM Peak congestion is low in the northbound direction and moderate in the southbound direction. Conditions are reversed in the AM peak.
- Horizon year (2040) conditions: congestion is expected to worsen in the southbound direction as volumes increase, eventually projected to exceed capacity. Conditions are reversed in the AM peak.

Table 4.1: SR 17 Concept

Segment	Description	Concept
1	From SR 1 to Granite Creek Rd	Maintain four-lane freeway.
2	From Granite Creek Rd to Santa Clara county line	Four lane conventional highway with partial access control.

The Segment 1 portion of the route will continue to be maintained and rehabilitated as necessary at present capacity. This concept includes assessing the feasibility of standardizing the freeway gap at La Madrona Drive and El Rancho Drive.

The concept for Segment 2 is to remain a conventional highway, with strategic investment related to access control as recommended in the SR 17 Access Management Plan. Emphasizing maintenance and preservation of the existing system aligns with federal, state, and regional goals of optimizing resources to manage, rather than expand, transportation infrastructure.

Strategies to Achieve and Maintain the SR 17 Concept

Caltrans will continue to maintain SR 17 in an equitable manner and encourage policy decisions that will garner additional funding for maintenance needs. This includes maintenance and operational improvements designed to get full return on system investments, as well as to maintain safety.

Operational Improvements

- Caltrans will continue working with Santa Cruz County Regional Transportation Commission (SCCRTC) and Santa Cruz County to implement short-, medium-, and long-range access management recommendations identified in the Highway 17 Access Management Plan.

Multimodal Improvements

- Caltrans will support Santa Cruz County Regional Transportation Commission (SCCRTC) and Santa Cruz Metro in efforts to improve the Highway 17 Express transit service as well as park-and-ride solutions adjacent to SR 17.

Maintenance and Preservation

- Caltrans' Goals include providing a safe transportation system for workers and users. Necessary safety improvements will continue to be addressed through the appropriate SHOPP category as needed.
- Proper preventative maintenance and rehabilitation of aging transportation infrastructure will prevent project deferrals, which lead to more expensive, full-scale replacements. Caltrans' Goal is to responsibly manage transportation assets.
- Caltrans recognizes the value of partnerships. Ongoing collaboration will be required to integrate planning for SR 17, the local road network, the local transit system, and local land use.

Planned and Programmed Projects and Strategies

Table 4.2: SR 17 Projects – Caltrans State Highway Operation and Protection Program (SHOPP)

Project	Description	Status
SR 17 Access Management Plan	Access Management Plan from Granite Creek Rd to Santa Clara county line.	PLANNING
Santa Cruz Bridge Rails	Bridge rail upgrade at the SR 1/SR 17 connector separation and Ocean St undercrossing – 4 bridges.	CANDIDATE
SR 17 Pavement Preservation (CAPM) (05-1F760)	Pavement preservation (CAPM) from 0.6 mile north of Granite Creek Rd to Santa Clara county line.	PID
SR 17 Pasatiempo Shoulder Widening (05-1C670)	Shoulder widening and soil nail wall from SB exit ramp to SR 1 to Pasatiempo Dr entrance ramp.	PAED
Santa Cruz 1/17 Shoulder Widening (05-1A870)	Re-striping and shoulder widening on SR 1 from NB merge with SR 17 to NB off-ramp to Ocean St.	PSE/ROW
Santa Cruz Worker Safety (05-1C100)	Roadside safety improvements on SR 1 from Larkin Valley Rd to SR 1/SR 17 interchange and on SR 17 from SR 1/SR 17 interchange to Santa's Village Rd.	PSE/ROW
SR 17 Storm Water Mitigation (05-0Q600)	Storm water mitigation from 0.7 mile north of the SR 1/SR 17 interchange to Beulah Park undercrossing.	PSE/ROW
SR 17 Shoulder Widening and Concrete Guardrail (05-0T980)	Shoulder widening and concrete guardrail from 0.9 mile north of Vinehill Rd to 0.5 mile south of Glenwood Dr.	PSE/ROW

Table 4.3: SR 17 Projects – SCCRTC Regional Transportation Plan (RTP)

Project	Description	Status
Freeway Service Patrol (RTC 01)	Maintain and expand tow truck patrols on Highways 1 and 17. Work with the CHP to quickly clear collisions, remove debris from travel lanes, and provide assistance to motorists during commute hours to keep incident related congestion to a minimum and keep traffic moving.	Partially Constrained
Highway 17 Express Service (MTD-P10B)	Operation and maintenance cost of existing bus service.	Partially Constrained
SR 17 Safety Program (CHP-P01)	Continuation of SR 17 Safety Program in Santa Cruz County at \$100/year. Includes public education and awareness, California Highway Patrol (CHP) enhancement, pilot cars, electronic speed signs.	Constrained
Emergency Access SR 17/Granite Creek Rd (SV-P24)	Connect Granite Creek Rd to SR 17 via Navarra Drive to Sucinto Drive, for emergency access.	Unconstrained
Highway 17 Express Service Expansion	Add trips to extend service hours for Highway 17 express.	Unconstrained
SR 17/Granite Creek Rd Interchange (SV-P08)	Realign/reconfigure the Granite Creek Rd overcrossing, add bike lanes and sidewalks.	Unconstrained
SR 17/Midtown Interchange (SV-P01)	Construct new SR 17 interchange midway between Mt Hermon Rd and Granite Creek Rd. Will require right-of-way.	Unconstrained
SR 17/Mt Hermon Rd Interchange (SV-P44)	Add lane to SB off-ramp at Mt Hermon Rd.	Unconstrained
Traffic Management (CHP-P02)	Patrol of SHS and unincorporated roadways aimed at minimizing traffic collisions and traffic delays; and provide assistance to motorists.	Cost TBD

RESOURCES

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LINKS

AMBAG Regional Forecast

<http://www.ambag.org/programs-services/planning/regional-growth-forecast>

Santa Cruz County Bicycle Plan

<http://www.sccrtc.org/services/bike/>

Santa Cruz County General Plan

<http://www.sccoplanning.com/PlanningHome/LongRangePlanning/GeneralPlan.aspx>

Santa Cruz Metro Transit District

<http://www.scmttd.com/>

Santa Cruz County Regional Transportation Commission

<http://www.sccrtc.org/>

U.S. Census Bureau

<http://www.census.gov/>

APPENDICES

Appendices can be accessed at: http://www.dot.ca.gov/dist05/planning/system_planning.htm#TCRs.

- Appendix A: SR 17 Corridor Data Sheet
- Appendix B: About the TCR